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DEEP PLOUGHING.

The Editor of the Museum is happy in having it in his power to contribute to the circulation of the following Essay on Deep Ploughing.—The author is deservedly conspicuous, not only for his skill in agriculture, but for the intelligence, fidelity and success, with which he has subserved the interests of his country in various other important respects.—He is not unacquainted with theory; but his deductions, plans and modes of operation, are chiefly the results of observation and experience.—About the year 1795 he settled on a tract of poor land, that had been worn out by the bad management of his predecessors.—In a few years by pursuing the system and method of tillage recommended in this essay, he greatly improved the quality of the soil and rendered it highly productive. His attention is now drawn to other objects—his business calls him much from home; yet if his own little farm has in some measure, ceased to exhibit such striking proofs as formerly, of the truth and soundness of his principles in this respect, they are still abundantly manifest in the farms of his neighbours, who have profited by his instruction and copied his example. It is above ten years since the Essay was written and given to the world—the system has since had several other advocates; it has been adopted and pursued with complete success in many other districts and parts of our country, as well as in the vicinity of Brookeville, where the author resides—and it bas, no doubt, had a considerable share in producing the very valuable improvements in agriculture, which have taken place in the United States since the conclusion of the revolutionary war—

but as much still remains to be done, it is hoped that this republication will be found to be, both acceptable to the patrons of the Museum and useful to the community.

An Essay on Deep Ploughing; or Hints for Improvement suggested. By Thomas Moore, of Montgomery County, Maryland.

Prejudice, that great bar to improvement in the arts and sciences, perhaps no where exerts its baneful influence with more mischievous effect than in the practice of agriculture, particularly on this part of the American continent. Our predecessors emigrating from the different European countries, each brought with him the prejudices he had imbibed in his native land, and adopted the practice in this country, that he, and perhaps his forefathers, for ages before him, had adhered to, notwithstanding the great difference of soil and climate absolutely requiring a very different course of conduct. These prejudices acquired strength by time; and being accustomed to consider ourselves as the children of the countries from which we descended, of course we looked up to them as the only legitimate sources of improvement; the consequence of which has been, that notwithstanding considerable improvements and discoveries in agriculture have been made in Great Britain and other European countries, we have not derived those advantages from them, which might have been expected. Many of them having been implicitly adopted here, without the necessary variation for the difference in soil and climate, have failed. These unsuccessful experiments have tended to confirm the people of America in their former prejudices, and to induce them to treat with contempt every appearance of innovation in theory or practice.*

* The Editor of the Museum takes the liberty to add that the writers on Agriculture themselves, both in Europe and in this country, have, in too many instances frustrated the object of their publications, by a shameful

So that, till very lately, a person in America would be almost as much exposed to ridicule by attempting to teach the art of ploughing, as that of walking, or any other common animal function. But happily for us, since the Revolution, some of the citizens of the United States begin to think for themselves, and to seek in their own country for improvements; and during the short period of twenty years since that event, greater advances have been made in American agriculture than in a century preceding.

Under these impressions, I am encouraged to hope, that at least a part of the community will not condemn the following observations unheard. I wish my readers to divest themselves of every prejudice, as fully as if they had never read a treatise on agriculture, or were

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inattention to practical agriculture on their own estates. The following extract of a letter from a gentleman of great experience and observation, places this absurdity in a very just point of view.

"I would not give a farthing for volumes written by any man who neglects to sow clover regularly, field after field, and whose uninclosed fields, foul pasture grounds, and inattention to the collection of manure, speak so loudly against the system he preaches. Such men never will be attended to in their own district, and what is worse, their conduct will tend to prevent farmers who know them, from reading books written in other countries, because they will suppose that their authors were as bad farmers as those they were themselves acquainted with. Nothing disgusts a person fond of farming and anxious to improve, more than the sight of disorder and bad management on the farm of a person who gives instruction to the public. Mr. West did more by the impression left upon his visitors, than if he had written volumes;—and A. Young, who certainly understands farming well, lost his authority early in life from an opposite cause. He has, however, done good by his writings.

acquainted with no system of practice, until they have fairly weighed the arguments: then compare them with their own experience, and according to their merits let them stand or fall.

The native soil of a great proportion of the U. States, so far as I am acquainted, or have been informed, consists of a black mould from one to four inches deep (on river bottoms, and other low places often much deeper) probably composed from leaves and other decayed vegetables. Immediately below this, is found a stratum of loam, clay or sand, most commonly loam, intermixed with some kind of stone. The mould or virgin soil is always found extremely productive.

The climate, with respect to heat and cold, is various; in the eastern and middle states, the frosts are severe, the surface of the ground being generally frozen for several months during winter; but their severity gradually decreases as we advance southward. In every part of the United States a considerable quantity of moisture falls in the winter and spring, in the different forms of snow, hail and rain. In summer, thunder gusts, with intervals of hot dry weather, are also common.

Let us now consider some of the most visible effects of the climate, on the lands in tillage.

The winter frosts are no doubt useful, in dividing and ameliorating the soil; repairing in some degree, the injury it sustained the preceding summer. During summer, a great proportion of the rains falling hastily, the consequence is, that wherever the ground is not opened to a sufficient depth, to imbibe the whole before the surplus can have time to penetrate the hard *pan* beneath, a part of the soil becomes *fluid*; and if the surface is not a dead level, a portion of it is carried off: the remainder has a tendency to settle into a *compact mass*, which, if suffered to remain, without stirring, through the hot, dry weather, that often succeeds, until the particles of moisture it contains, are evaporated, becomes of the consistence of a *sun dried brick*, and consequently impervious to the roots of vegetables,

These things being premised, I shall, without further observations, proceed to the subject matter, and endeavour to enumerate some of the evils inseparably attached to that great error in American agriculture, *shallow ploughing*; beginning with new lands, or those just cleared of wood.

What is the language of our farmers and planters on these occasions? Our soil is not more than two or three inches deep; we must plow *shallow*, otherwise we shall turn up too great a portion of *dead earth*, and ruin our crops; they also say we must plant *wide*, otherwise a drought will cause our corn to fire;* and for these supposed weighty reasons, those two practices are almost universally adopted on new lands, to wit: shallow ploughing, and wide planting.

Here our men of experience prove they are acquainted with the effect, without knowing, or even enquiring into the cause. Their mistaken opinion respecting dead earth, will be noticed in due place; but it remains here to be proved, that the necessity of wide planting, is one of the consequences attached to shallow ploughing. All plants imbibe moisture from the earth, by their roots; if this portion of their sustenance is withheld, though every other species of vegetable nutriment abounds in the soil, the plant becomes sickly, growth ceases, and finally, death ensues. In search of the necessary supply, the roots of plants are extended in all directions, where the soil is open enough to admit them, and to a distance, proportionate to the demand; two plants of the same kind, require a greater quantity, to preserve health, than one: hence it will appear, that a drought of sufficient duration to extract most of the moisture contained in that part of the soil loosened by the plough, may yet leave sufficient to preserve one plant in health; but if divided, both must suffer, for neither can penetrate the hard unstirred earth below, for a supply. But in case of long droughts, no distance whatever will insure Indian corn from suffering,

* The lower leaves turn yellow.

when the under stratum is hard, and the ploughing shallow; and under these circumstances, few summers are so wet, but that close planted corn. at some period of its growth, discovers the want of a full supply of moisture, which perhaps might be amply afforded by one or two inches greater depth of ploughing. They have discovered, that after the first year, several succeeding crops will admit of being closer planted: the fact is, that the surface having now been for some time cleared of leaves, rubbish, &c. and exposed to the action of frost, sun and dews, that portion of earth, lying originally immediately below the black mould, and called dead earth, which was turned up by the cultivation of the preceding year (for in common soils, it is almost impossible to plough so shallow as to avoid turning up some, in new grounds) has now acquired a dark colour, and therefore not known to be the same; and some of the obstacles to ploughing, being removed, they almost insensibly, go an inch or two deeper, without shewing any greater appearance of the yellow or dead earth, so much dreaded, than the preceding year: this furnishes a more extensive pasture, * for the roots of the plants growing therein, and also becomes a more copious reservoir for treasuring up moisture for the needful time; and consequently affords a supply for a greater number of plants. The second year, is generally found to be much more productive than the first, after which our common lands gradually decline.

The undecayed fibrous roots prevent much loss of soil by washing, the first year, on lands not perfectly level; it generally begins the second, and continues annually. The ploughing being about four inches deep, does not afford a sufficient quantity of loose earth, to imbibe the whole of the heavy showers that frequently fall during summer; the consequence of which is, as before observed, that when the open soil becomes *saturated*, wa-

* For want of a more appropriate term, the word pasture is used to express the body of loose earth, into which plants freely project their roots in quest of food.

ter must accumulate on the surface, and flowing off in torrents, bears away a portion of the finest, and most valuable part of the soil; succeeding ploughings brings to the surface a fresh supply of mould, which in turn follows the last. Thus ploughing and washing alternately, following each other, the original soil is soon deposited in sunken places, beds of creeks, rivers, &c.

This waste is in some measure compensated, and fertility continued, by the fresh earth brought up from below; for the plough continuing to pass about the same depth, must of course descend into the unstirred earth, in proportion as the open soil is carried from the surface; but of this the cultivator appears ignorant; the proportion brought up at each ploughing, being small, and soon acquiring a dark colour by being exposed. I am fully convinced, that in many places the surface is now at least the whole depth of the ploughing lower than at first clearing: Of this we need no other proof, than the half buried posts in low places, the heads of rivers, creeks and mill-ponds filled up, which are every where to be seen in our hilly cultivated lands.

But, notwithstanding the before mentioned supply of vegetable earth from below, the soil employed in cultivation, must annually become less fertile; because the coarse, the heavy and adhesive particles of earth, remain on the spot from the beginning, and those of the same properties contained in the fresh earth brought from below, also remaining, while the finer and more friendly parts, are continually carried away; at length the proportion of fine soil becomes too inconsiderable, to answer the purpose of vegetation to any degree of profit. Thus the land becomes sterile, not so much from the vegetable nutriment being extracted from the soil by the growth of plants, as by the soil itself being removed: that this is a necessary consequence of *shallow ploughing*, on lands that are in any degree hilly, in this climate, I trust, has been satisfactorily proved.

Another material evil that results from the practice of *shallow ploughing*, and which applies to all surfaces, level

as well as hilly, is the injury the growing crops sustain for want of a more regular quantity of moisture in the soil: we know by experience, that either extreme is fatal to most of our crops; that the practice is calculated to produce both at different periods, is evident: for, during a long continuance of *wet*, for the reasons before mentioned, the water must *stagnate* in abundance about the *roots* of the *plants*: and on the contrary, a short continuance of *drought*, extracts nearly the whole of the *moisture* contained in the thin covering of loose earth; and it is not to be supposed, that the tender roots of plants in quest of a supply, can penetrate the compact earth below, which has been hardening ever since its formation.

Hitherto I have principally alluded to summer crops; but if we observe the effects of shallow ploughing on winter crops, we shall find the injury still greater. All that has been said, will apply to them in their autumnal growth; but it is in the spring, and early part of summer, that it often proves particularly injurious, and sometimes fatal to them. Those who have been accustomed to stopping leaks, about mills, &c. know that earth thrown into water, made to incorporate with it, and then subside, settles into a more solid mass, and becomes more impervious to water, than in any other way it can be applied; no ramming is equal to it: the same thing frequently takes place in a degree, on the surface of our fields. The great rains that often fall about the vernal equinox, drench, and almost render fluid, our shallow worked soils; the solution of the finer parts, entering the pores, as the water evaporates, the whole settles into a compact mass, and so remains till harvest; for, notwithstanding it may be frequently moistened, yet no other disposition of parts, can be supposed to take place, until operated on by frost or the plough.

This state of the soil, is too compact to admit of the free extension of the roots, even when moist; but, when hardened by droughts, every particle of nutriment not in contact with some of the roots, is effectually locked

up from the suffering plants. So that it often, nay almost always happens, on lands worked in this way, unless very rich indeed, that crops of wheat that look promising in the fall, and early in the spring, begin to decline towards harvest; and people are complaining of the unfavourable appearance of their wheat: when harvest arrives, the straw is almost too short to cut, and the heads about half the proper length, and those not well filled, yielding six or seven bushels to the acre, where twelve or fifteen might have been reasonably expected, from the quality of the soil: these appearances and products agree with my constant observation for many years past, especially on early sowed corn ground, damages by fly, rust, &c. excepted.

If manures are applied to shallow worked soils, their good effects in general, will be of short duration, as most kinds must soon inevitably travel the road the virgin soil has before them.

I shall next enumerate some of the good effects to be expected, and which are constantly experienced by a contrary practice, viz. deep ploughing, when judiciously pursued; and then endeavour to prove the futility of the arguments adduced in favor of shallow ploughing.

In the cultivation of plants, three things are particularly necessary: First, that sufficient pasture is prepared for their roots; secondly, that the soil abounds with proper aliment, and thirdly, that moisture be duly administered in neither too great nor too small quantities. That deep ploughing is calculated to promote these ends, I believe, will not be hard to prove, particularly the first, and third.

The quantity of earth operated on, being great, it very seldom, if ever, happens, that any fall of rain is so great, as completely to saturate it; and until that effect takes place, or nearly so, very little change is to be expected in the disposition of its parts; and therefore when the redundant moisture evaporates, it leaves the soil as it found it, except a small crust on the surface: the succeeding

ploughings, instead of being applied to repair the injury the soil has sustained by great falls of rain, go to the further pulverising and opening it, suitably to receive the capillary vessels of the plants. Thus the pasture becomes not only more extensive, but far better adapted to promote the growth of plants.

With respect to aliment, naturalists differ widely in their judgment respecting its nature and composition: my opinion is, that the food of plants has not yet been fully ascertained by any. This, however, we all know, that manures of all kinds, contribute in some way or other to the growth of plants; whatever may be their food, I will not pretend to say that it is communicated to the soil by the mode of cultivation under consideration; but this I will say, that it is far better calculated than the contrary practice (shallow ploughing) to retain the quantum originally found therein, or afterwards applied to it; and further, if dews are nutritive, the superior openness of the texture in this mode, qualifies it to derive every advantage to be expected from that source.

But, perhaps the most valuable of all the effects resulting from deep ploughing is, that it in a great measure preserves an equal quantity of moisture in the soil; for as we seldom have a rain so great, as to produce an unhealthy stagnation of water about the roots of plants set in a soil seven or eight inches deep; so on the contrary, we scarcely ever have a drought of so long continuance as to extract all the moisture to that depth; for it is to be remembered, that after a few inches nearest the surface, moisture is extracted, by slow degrees: thus for instance, if it requires one hot day to dry the first inch, probably it will require three, for the second, six, or more, for the third, and so on, perhaps nearly in geometrical progression.

Thus it appears from the foregoing observations, that by this mode of practice the great loss sustained by washing, an evil so much to be dreaded in this country, is avoided; that whatever manures are applied, are safely deposited, and will act with full effect; that the

growing plants are abundantly supplied, during the whole of their growth, both summer and winter with an open soil, for a free extension of their roots, and also, with a regular supply of moisture; so that their growth is at no time impeded by any small irregularity of season; the depth of soil being to them, with respect to wet and dry, what the ocean is to small islands, with respect to heat and cold, the means of a tolerably regular temperature.

I can readily anticipate the remarks of our sticklers for old practices, on what has been advanced. This reasoning (say they) well applies to rich deep soils; but in poor shallow soils, "let him beware of the yellow clay, the dead earth, lest the value of his land proves to be the price of his too adventurous experiments." But let me ask them, have they never seen the effects of earths taken out of cellars and wells, when applied to poor land? have they never observed the luxuriant growth of grass and weeds, at the edge of a bank, taken from a mill race, or large ditch, and frequently on the very top, when flat enough to retain moisture? for my own part, I have long been in the habit of observing these things, and do not recollect that I ever saw any earth taken from a considerable depth below the surface, which was capable of being pulverized by frost or tillage, without evident advantage, even when clay has been applied to clay, and sand to sand. Seeing this is the fact, is there any good reason for supposing, that, as we ascend toward the surface, such a difference will be found in the properties of the earth, that this will render the same land sterile, that the other will enrich? I confess I see none; I cannot even see, why we may not with propriety suppose, that the first six inches of earth next below the usual ploughing, should be possessed of all the fertilizing qualities, that the same kind of earth would be, if found six feet below.

It would seem then, that by this mode of cultivation (deep ploughing) on exhausted lands, the quantity of soil would not only be increased, but actually enriched. On

lands, covered with two or three inches of rich mould, it will probably have a contrary effect in some degree, yet even in this case, the advantages resulting from an encrease of quantity, will be found abundantly to overbalance the small abatement in quality.

Their prejudices, in all probability, have proceeded from injudicious experiments; very few planters break up ground in the fall; in the spring their teams are often weak, and were they disposed to plough a spot deeper than usual, would very likely choose to do it when wet, on account of its being easier performed; soon after which the crop is to be planted or sowed, which proves the worse for the experiment, and the planter is disgusted with the practice: he informs his neighbours of the ill success of his experiments; and perhaps, a whole neighbourhood is thereby afresh confirmed in their former belief that the good old way is best—to plough as deep as they find black soil, and no deeper.

Ploughing land that contains a considerable portion of clay, in a state too wet to break, as the furrow leaves the plough, is, thereby, rendered more compact; and when hardened by the sun, becomes entirely unfitted for the production of vegetables; and is scarcely to be reduced by any succeeding tillage during the same summer; indeed, I believe, nothing short of a winter's frost will effectually pulverize it. The best devised system of practice, may be rendered entirely abortive, by being put into the hands of unskilful practitioners to execute.

Lands that are to be ploughed much deeper than usual, ought to be broken up in the fall; and would be the better to be ridged, that more surface might be exposed to the frost: If omitted till spring, it ought to be done as soon as it becomes dry enough to break freely before the plough: No crop should be put in that season, that requires to be seeded, before it can have several ploughings and harrowings at proper intervals; otherwise, the expectation of the cultivator will probably be blasted.

If, notwithstanding what has been advanced, I should be called upon for proofs—should be told that the evils

complained of on one hand, are, in a great measure, ideal; and that the advantages proposed on the other, are theoretical, and remain to be confirmed by practice. With respect to the first, it would, perhaps, only be necessary to say—what further proofs need we, to convince us that the practice of agriculture, particularly in the southern states, is miserably defective, than the deserted old fields that so frequently present their disgusting surfaces from Susquehanna to Georgia? Some years ago I was of opinion, that this speedy reduction of soil, was altogether occasioned by the nature of the crops cultivated thereon; but, on attending more accurately to the subject, I am of a different opinion, and believe, as I have already said—it is more from the manner of cultivation than from the exhausting properties of the crops; of this, one thing has tended to convince me; I have observed, that when an industrious person, from another state or country, where the cultivation is generally deeper, has settled on these exhausted lands, that they frequently improve for some years; although the same crops, or those equally as exhausting are cultivated; and, instances I have known, of some of these old fields becoming very productive without manure.

Almost every summer furnishes abundant proofs of the great disadvantage of the practice of shallow ploughing, to both summer and winter crops; if we were but disposed to open our eyes and look for them. A very curious one happened on my own farm.

A field was sowed with wheat by a tenant, the ploughing from three to four inches; a deep hollow extended across part of the field, in a direction nearly east and west; the side exposed to the north tolerably good, the south exposure very rich; as might be expected, the wheat on the strongest soil made the most promising appearance in the fall, and also for some time in the spring; in the early part of which clover seed was sown on the whole, which came up well; a drought came on late in the spring; the south exposure drying first, the wheat soon showed the effects of it; and, the drought continu-

ing, a considerable part entirely perished; the north exposure also suffered, but being more shielded from the action of the hot sun, was not so effectually dried. At harvest it was much the best wheat, notwithstanding the superior richness of the soil on the other side. A still greater difference appeared in the young clover; on the south hill side it was almost entirely killed, on the other very little injured.

I have had some experience of the beneficial effects to be derived from deep ploughing; but the obstructions in most of my fields (particularly large stones just below the surface) have prevented my adopting the practice so fully as I could wish; yet the success that has always attended my experiments, in conjunction with my observations on the practice of others, has been conclusive evidence to my mind.

In the year 1795, I took possession of my present farm, and had a field ploughed for wheat, which had been thought for several years before, too poor to cultivate, either in wheat or Indian corn: I saw rye growing on the best part of it, two years before, just before harvest, that I think would not yield two bushels to the acre. It was ploughed early in the spring, about eight inches deep, and repeatedly with harrowings, at proper intervals, several times during summer; it was sown about the last of the ninth month. The soil being weak, the growth in the fall was slow, as also in the spring, yet regular, the colour always good and no appearance of suffering, either from drought or wet; at harvest, the straw was not tall, nor thick on the ground, but the heads large and well filled; the product, between sixteen and seventeen bushel per acre, except a part of the field, sown with a kind of wheat I was not before acquainted with, which was too thin, in consequence of a short allowance of seed. I observed the state of the soil, from time to time, until harvest, and found, that even then, it was open and in good tilth, except a crust of two or three inches, next the surface.

In the spring of 1796, with a large plough and four horses, I broke up part of a field; I measured the ploughing frequently, and found it in many places eleven inches deep, and no where less than seven; so that the average was at least nine. This piece contained about four acres, on a gentle declivity; the surface too much exhausted, to pay for cultivating any crop in the common way: this ploughing brought to the surface about five inches of earth, that had never before been exposed, which was principally clay; at the upper edge of the piece, of a bright yellow, which became gradually paler, further down, and of a bluish appearance near the lower side. After several sturrings, it was sown with buckwheat the same year; the crop tolerable; after the buckwheat came off, the ground was ploughed and sown in rye, in the eleventh month, very little of which came up, owing, as I suppose, either to its being too late put in the ground, or the seed not good. It remained without further tillage, until last year (1800) when it was again sown in buckwheat, which grew so large, as generally to fall. Before it was ploughed in the spring, I took several of my friends to see the difference in the appearance of this piece and the ground adjoining, that had lain the same length of time out of tillage; it was discernable to a furrow; the deep-ploughed piece appeared of a fine open texture, and dark colour, thick set with white clover; the adjoining ground, compact and hard, of a pale ash colour, bearing scarcely a blade of any other kind of grass, than that common to old fields, known by the name of poverty-grass: In short, one had the appearance of an exhausted old field, and the other of land lately manured. Those who expressed a sentiment on the subject were of opinion, that to those who did not know what occasioned the difference, the deep ploughed piece, would sell for double the price of the other.

Part of another field, from having a very retentive clay near the surface, was of that kind called cold, or sour land, and was thought unfit to produce any crop; either water or ice generally appearing on the surface, in an

open time in winter. This was so thick set with white flint gravel and stones, that the first ploughing could not be deep; but having cultivated several crops on it, taken off the largest of the stones, and consequently been able to get a little deeper at each succeeding ploughing, the nature of the ground seems altered, so that now there is seldom either water or ice to be seen on its surface, more than is common to other places: It is now in red clover, very little of which has been injured by the open winter. This piece has been manured; it is therefore, unfair to ascribe the quantity of the crops, which have been good, to deep ploughing only; though I am of opinion, that on such land, manures are not of much consequence without it.

I might have before observed, that one of the objections that will probably be made to deep ploughing, is the greater strength of team that will be requisite to perform it, and consequently an additional expense. This I believe, on consideration, will also be found to be without foundation. True it is that the first ploughing requires more strength of team; but then it is equally as true, that if the plough is a good one for the purpose, almost double the quantity will be performed in a given time. The four acres above mentioned, was ploughed by four horses in less than two days; the furrows averaged seventeen inches in width. And as ground ploughed in this way will not acquire the same degree of firmness for many years afterwards, although it should remain untilled; it will be found, that three horses to a plough will be sufficient for after ploughings, even for a grass-lay; and that two such teams will perform as much in a day as six horses in three ploughs of the common kind, and of the common description of ploughing. Here then is a ploughman saved. In addition to this, it is to be remembered, that for reasons before given, land cultivated in this way, will be preserved in good tilth with much fewer ploughings than in the other mode.

Thus, let the subject be considered on whatever ground we choose to take it up, either with respect to

the preservation of the soil, the quantity of produce, or the quantum of labour bestowed, the advantage is greatly on the side of the method proposed

But, let me again repeat it, that those advantages depend in a great measure on the manner of performing it It must never be forgotten, that ploughing when the soil is very dry, is of no other consequence than to destroy weeds; but when over wet, in stiff soils, the mischief is incalculable; it is at least irreparable for that season.

If any should be still disposed to condemn the foregoing observations untried—to say, that if those extraordinary advantages will result from deep ploughing that are ascribed to it, they certainly would have been long ago discovered, and the practice universally adopted; that a great proportion of the inhabitants of the United States, being engaged in the business of ploughing nearly one half of their time, it is not reasonable to suppose those things could have escaped their observation.

As a full answer to such, let me call their attention to some of the absurd practices that the best of our cultivators are but just emerging from; and that probably they themselves remain in; let them view their own practice in these things, and then say, whether they feel that consciousness of perfection, that will justify them in condemning proposed improvements without trial.

Let them reflect a moment on the propensity that almost every planter feels for clearing a piece of land every year, which is very commonly continued until there is little or no wood left, either for fuel or fences; and very often it happens that in the latter stages of this erroneous conduct, more than half their cleared land is so far exhausted, as not to be worth cultivating; more acres of which, than they annually clear, it is amply within their power to reclaim and render as fertile as ever it was, and that with half the expense; yet strange to tell, every acre is neglected, while the clearing business is pursued with avidity, until at length, the fatal blow is struck, and necessity compels them to part with their murdered estates for a trifle, and seek refuge in the Western coun-

try. Witness, some of the lower counties of Maryland and a great part of Virginia.

Let them reflect on the immense labour that has been bestowed in the Southern states, in the business of raising great hills about Indian corn. It is now acknowledged, with good reason, by many of the best planters, that it is altogether useless in promoting the growth of the corn; but say they, it is absolutely necessary to raise a small hill, to prevent the corn from falling, by storms of wind and rain. Let us try the wisdom of this improved mode. Every one who has paid attention to the growth of corn, must have observed, that before, or about the time it arrives at the state of danger, it is sure to send out a circle of strong roots just at or a little above the surface; these are the supports of nature; and so well are they adapted to the purpose, that we seldom see a stalk torn up by the roots, except where the earth is previously washed from about them. If let alone, there is no other danger to be apprehended than from the breaking of the stalks, which indeed, sometimes happens, and which hilling does not prevent. If it is bent down by wind and rain, when the wind ceases and the blades are released from their burden of moisture, it will of course rise. But the officious planter must do something to assist nature. He accordingly raises a hill; how does it affect the plant? Let him observe it soon after, and he will discover he has mistaken his aim; that nature, feeling herself thwarted, is endeavouring to repair the injury, by retaining a part of the nutritive juices provided for the support of the shoots above, for the purpose of sending out a new set of braces above the new raised hill. This takes time, and frequently before the new roots have taken hold in the earth, a gust of wind and rain comes on; the consequence of which is, that the hill soon becomes softened by the rain, and the wind at the same time pressing the stalk against it, it gives way and leaves an opening behind the stalk; this opening is instantly filled by the rain beating the earth into it, and the stalk secured as far as it has gone; another blast forces it still

lower, and the same effect succeeds behind it; when the storm is over, we find the stalk fixed precisely at that point of depression, at which the hardest blast of wind left it, after the hill became wet. This is the present improved mode of hilling corn.

Let them reflect on the present mode of supporting their stock, which is principally from the corn-house; by neglecting the culture of grasses, the stock is maintained (if well maintained) at more than double the expense that it might be by a proper attention to grass; and the land at the same time reduced to poverty, that would otherwise be enriched by such attention.

Now my friends, view yourselves impartially in the mirror thus held up to you, and I believe you will cease to wonder, that you have not long since discovered the advantages of deep ploughing.

Hitherto I have treated of the beneficial effects to be derived from deep tillage abstractedly, and no further than abundant co.roborating proofs will substantiate; but believing as I do, that if ever a material reformation takes place in American agriculture, that this will be the basis; I am induced to offer a few hints for consideration, respecting the probable advantages that may be derived from the practice, when combined with other necessary improvements; such as a due attention to manures, rotation of crops, &c. &c.

By a proper attention to these things may we not reasonably hope for the speedy fertilization of thousands of acres of exhausted old fields, that now will not pay for enclosing? To effect which I would propose, that the system by which they have been reduced to their present state of poverty, be in all points reversed. They have been reduced by shallow ploughing, an ill-chosen rotation of crops and a total neglect of manure. Let them be recruited by deep ploughing, a favourable rotation, and all the manure which the best management will afford them. My plan would be this; break up the ground in the fall, ploughing at least eight inches deep; if level throw it into ridges; if hilly, begin at the base and sur-

round the hill, if the situation will admit; if not, turn a furrow down the hill and let the plough return light; for if the furrows are attempted to be turned against the hill, it will not be effectually done, and the whole business will be thereby marred. In the spring, plough and harrow as often as convenient, or as the state of the ground seems to require; always keeping to the same depth: If a sufficient quantity of manure is in readiness, the last ploughing should turn in from twenty-five to thirty large cart-loads per acre; then plant with potatoes; after they are dug in the fall, either sow down in wheat, and early in the spring red clover-seed; or let it lie over winter, and sow in the spring, barley or oats and clover.

If manure cannot be procured the first spring, let not the industrious improver be discouraged; but instead of potatoes, substitute some shading crop, that does not require so much strength of soil; such as peas, beans or buckwheat. I have no doubt that if the foregoing instructions are attended to, on ground that has ever been tolerable, that one or other of these crops may be cultivated to profit: This will also better prepare the ground for the next year's operations, by which time it is presumed the cultivator will be furnished with manure to proceed as before mentioned. In planting potatoes on hilly ground, or any other crop set in rows, and requiring to be ploughed or hoed whilst growing, more attention should be paid to the rows being horizontal, than in straight lines, as being more favourable to derive advantage from hasty showers, and also to prevent washing. In most situations and soils it will be found that the clover will be much improved by the use of plaister of Paris, as a top dressing, and ought not to be neglected when it can be procured.

If by these means a good swarth of clover is produced, I consider the land as reclaimed; for I know of no better preparation for a crop of wheat, than a clover-lay well turned, after being mowed two years; the wheat sown on the ploughing and harrowed in.

Lands once reclaimed by these means, will by a similar course of management, that is, by deep cultivation, a well chosen rotation, and manuring as often as practicable, be kept in fine tilth with much less labour than in the present mode. May we not then expect by a proper attention to these interesting considerations, great improvements in the cultivation of Indian corn, tobacco, potatoes, peas, beans, &c? We have found by experience, that these crops particularly, require the soil to be kept open and clear of weeds during their growth; in order to effect these purposes, the common practice with respect to corn is, to plough and cross plough frequently, three or four inches deep, until about the time of tasseling or blossoming; in addition to which, many hill several times, and nearly all once at least: The other crops are mostly ploughed, and almost universally hilled But provided we can attain these ends (viz. the destruction of weeds, and an open soil) by other means, are those practices rational? Any one who will be at the pains to search, may easily discover, that the roots of corn soon extend themselves a considerable distance from the hill; by the time the top is knee high the roots are extended nearly from row to row (if not too frequently cut off by the plough) though so small as to be scarcely visible. Is there any good reason to suppose, that nature requires those numerous organs, prepared for the express purpose of supplying the rising plant with sufficient nourishment, to be so frequently mutilated, as must always happen in ploughing? thereby not only depriving the plant of that quantum of supply contained in the amputated vessels, but also of all future supplies by the same sources.

True it is, that above ground we frequently find it necessary, apparently to oppose the operations of nature in some measure, in order to bring her to act more consistently with our views. For instance, fruit trees, and many kinds of plants that bear their fruit upwards, often project so many branches and suckers, that notwithstanding the fruit may be thereby encreased in number, yet

we find it necessary to lop off a part, in order that the whole of the nutriment may be applied to the remainder; improving the quality, and frequently encreasing the quantity thereby. But, that it is necessary to diminish the roots that supply the nutriment, I believe has never been proved by any experiment.

Yet nevertheless, we constantly see the good effects of frequent plowings; the reason is obvious; in the common mode the ground becomes too solid in a few weeks, sometimes in a few days, for the roots to penetrate, and therefore it is better for the plant, when all its vessels of supply are embargoed, to part with one half, if thereby admittance is obtained for the other half to act freely. So that it may be fairly said, in the culture of Indian corn, of two evils, we choose the least. The important question is, how shall we avoid both? May I not answer, by attending to the foregoing instructions?

A suitable rotation, and the necessary preparation of the ground before planting, will so far clear it of weeds, that one or two ploughings and as many harrowings afterwards, will complete that business; all which may be done by the middle of the sixth month, without material injury to the roots, as the corn at that time is seldom more than a foot in height. If these ploughings are of the depth before mentioned, there will not be the least danger of the soil becoming compact for a few weeks, until the growth is so much encreased, as almost completely to shade it; after which it will need no ploughing to keep it open. This effect will generally take place in this state about the middle of the seventh month; for it is to be remembered that in this mode, it may be planted much closer than in the common way; the number of plants not being estimated so much from the surface as from the quantum of soil employed, as before hinted: for instance, if one plant requires a yard square of soil, of three and a half inches depth, the same surface, will be more certain to bring to perfection two plants, when worked seven inches deep; experience having proved, that in some particular rich deep soils, corn will admit of

being planted four times closer that is usual, without suffering from a want of air. Thus it is probable, nay experience has already reduced it to a certainty, that half the ploughings usually given to corn, may be made to produce double the quantity on the same ground: What an immense saving of labour! What an immense saving of land!

Much of what has been said with respect to corn will apply to the other crops, but as they are more generally hilled, I am willing to express a sentiment on that practice in general.

It has long been a matter of doubt with me, whether any kind of crop we cultivate requires this mode of tillage, except it be on low grounds, merely to avoid too much wet; and the greater opportunity I have had of making observations, to ascertain the fact, the more I have been confirmed in the sentiment. I believe it will always be found that nature disposes plants to make the best of their situation; to project their roots at such distances from the surface, and in such directions as are best calculated to extract their food from the surrounding soil: is it not then reasonable to suppose, that in removing the earth from the extremities of the roots, and heaping it about the body of the plant, we more or less derange the economy of nature? and instead of aiding we involve her in difficulties not to be surmounted, but at the expense of a part of her vital secretions.

I have examined the vines and roots of potatoes that have been much hilled, which plainly showed, that no less than three different sets of roots had been projected at as many different times, designed by nature to bear the fruit; the first and second having bulbs as large as peas or gooseberries; the third and nearest the surface bearing the burden of the fruit: These last springing from a part of the vine that must have been above the surface before the first hilling.

For notwithstanding the fibrous roots extend as deep as the fine open soil, the potatoes incline to lie about four or five inches from the surface. The shape of the

hills or ridges, are also unfavourable to the retention of moisture I have frequently seen potatoes dug that have been manured in the roots and several times hilled, which appeared to have derived very little advantage from the manure, which has been turned out dry, and nearly in the same crude state in which it was applied, not having received moisture sufficient for the purpose of fermentation. The best potatoes I ever had, were produced with scarcely any hilling, the ground being kept open by other means, the same thing I have known to happen in the practice of others.

Having mentioned that within certain limits, exhausted lands may be reclaimed at half the expense that new lands are cleared, and also the quantity of manure that I apprehend necessary for the purpose, it may perhaps be expected, that I should say by what means such a quantity is to be collected, and also point out the favourable rotations before alluded to.

With respect to these much might be said, in addition to any thing I have seen published, especially on the subject of manures; but as they have already engaged the attention of many of our citizens, and as my present views are not to enlarge on subjects treated by others, but briefly to suggest a few things which appear to have escaped notice, or at least that attention I have believed their importance required; I shall say little on these subjects; but recommend enquirers to some small tracts written in our own country (to wit) G. Logan on rotation of crops—J. B Boardly on the same*—and Richard Peters on Gypsum.†

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* Since writing these remarks, I have been informed that J. B. Boardley has published a considerable volume on agricultural subjects; but not having seen any of his writings, except his sketches on rotation of crops, I can form no opinion of the merit of the others.

† I agree with this author, as to the liberal use of this manure, but have taken the liberty of offering a theory of my own, with respect to the manner of its operation, as will be seen in the course of this essay.

But as it may not be practicable for all to be furnished with these authors, I will endeavour to sketch the outlines of what I think good management in these respects.

In the first place, house as many of the stock as possible throughout the winter, always keeping them well littered. Cattle that are not housed should have all their food given them in the barn-yard, which should be so constructed as to prevent any wash passing away from it; an excavation should be made in some part of it, and always well supplied with mulch of some kind; such as refuse straw, weeds, corn stalks, rich earth or leaves from the woods, or several of them together, in order to imbibe the soakings of the manure thrown out of the stables, and also that which lies on the higher parts of the yard. All kinds of refuse substances capable of being converted into manure, ought to be thrown into the yard. The manure should be carted out in the fourth month and the yard again littered. If a considerable part of the materials remain unrotted when taken into the field it is not to be regretted, only let the quantity be the greater, and have it immediately ploughed in; for I am clearly of opinion, that the putrefying fermentation, can no where be carried on to so much profit as in the soil.

My management for two years past has been very indifferent, yet I have been enabled to manure one acre for every three head of grown horses and cattle, kept over winter, and nearly one from the hog pen. The land it was applied to, with common cultivation without manure, would not have produced one barrel (five bushels) of corn to the acre; with the manure and tolerable cultivation, it produced six barrels. If it had been applied to land already in tolerable heart, I believe the proportional increase would have been much greater. This year my management has been better, but far from perfect, yet I expect to manure nearly an acre for every two head, at least I am certain the thing is practicable.

The principles upon which good rotations are founded, are these: That the naked soil be as little as possible exposed to the heat of summer; that ameliorating crops,

so intervene exhausting ones, as to prevent a speedy reduction of the soil, and that the preceding crop should prepare the ground for the next that is to succeed it without much labour. Thus, for instance, a crop of beans or potatoes, prepares the ground for wheat, to be sown as soon as they are taken off: Indian corn or potatoes prepares for spring barley and clover; and clover prepares for wheat Buckwheat may be sown on wheat stubble, which cleans the ground for corn with manure the succeeding spring. These may be varied as best suits the soil, situation, or market, always keeping the first principles in view.

On soils inclining to stiffness, pasturing ought to be avoided as much as possible, and cutting and feeding green, substituted. The injury by treading on such soils, particularly when wet, is more than many are aware of. I have run a fence across a field set in clover, one side of which was afterward mowed two years, two crops each year; the other was pastured the same length of time, principally by beef cattle, which continued in the field day and night, and consequently deposited their dung there; these divisions were both sown down in wheat, in the tenth month; the part that was mowed, with one ploughing about seven inches deep, and harrowed in: It was observable in the latter part of summer, that the part pastured, was become too compact to be reduced by one ploughing and harrowing; it was therefore broken up in the eighth month; afterwards harrowed, then ploughed again about the same time with the other, sowed and harrowed in; the ploughing likewise about seven inches. At harvest, both sides of the fence were good, but the part that was mowed, much the best, I believe about five or six bushels per acre.

Thus, all my experiments and observations have uniformly tended to establish one fact, which is, that in order to insure success for a length of time, it is necessary that the soil be kept in fine tilth, and that to a considerable depth. In some parts of our rich Western country, nature seems to have effected this purpose, in great a mea-

sure, without the labour of man. The earth being here covered with a fine black mould, to a greater depth than the deepest ploughing. As long as it continues in this state, the operation of the plough and harrow, will be of little other use, than burying the seed and destroying weeds. There are also two other kinds of soil, frequently to be met with in the Atlantic states, which are often preserved for a great length of time in a state favourable to vegetation, without much attention; these are, the fine black sandy soil, and the soil that abounds with calcareous earth, or lime-stone lands: Yet even on these, I believe we should find our account in a deeper cultivation than is usual. But by far the greater part of our country, is of the kind alluded to, in the foregoing remarks.

Seeing then, such a state of the soil is absolutely necessary, it becomes the great, the most important business of the husbandman, in the first place, to produce it, and then to perpetuate it by all the means in his power. I am far from believing, that these ends can always be profitably attained by means of the plough only; but that more depends on the judicious use of that instrument, than has generally been supposed, I trust, has been demonstrated. It is scarcely needful to add, that a fertile soil is always of a dark colour, and soft to the touch; and whatever applications will produce this appearance and texture, is a manure. I shall here offer a few observations on the extraordinary effects of plaster of Paris or gypsum, leaving others to judge, whether this effect on the soil, is not to be considered amongst the principal virtues of manures in general.

The great effect of this wonderful substance, is visible to all; but the manner of its operation is mysterious.—Among the various conjectures respecting it, some have pronounced it a powerful stimulus, which putting all the vegetative powers of the soil in action, produces one great effort, and afterwards leaves the soil barren. This reasoning (if it may be so called) upwards of twenty years experience has proved to be fallacious. Others, with

greater plausibility, have attributed to it, an attractive property, whereby vegetable nutriment is extracted from the atmosphere; and some others say, mere moisture only, is attracted; as a proof of this attractive property, they adduce the fact, that dew is to be seen later in the morning on grass that has been plastered, than on the adjoining that has not.

This theory (though apparently plausible) in my view is not without insuperable objections. I would ask in the first place, what change it undergoes in the soil, that disposes it to attract moisture more copiously than when above ground? I have not been many days without having some of it in a pulverized state in my possession, for several years, and have often looked in different kinds of weather, for that effect, and have as often looked in vain: I have never seen any thing like moisture about the substance itself, nor the vessels that contained it, neither in damp nor dry weather, more than was common to other substances; on the contrary, I have sometimes dampened some to sow, and have found it inclined to dry very quickly. It is well known, that on lands where the proportion of clay is great, it has no perceptible effect: I have also found, as well as some others, that where applied to a fine mellow soil, the effect is very little: if it operates by attraction, why not attract here, as well as in other soils? certainly both would discover the good effects of a supply of moisture in a dry time.

I would suggest for consideration, whether its effects may not be satisfactorily accounted for, on the principle before alluded to, as the basis of agriculture, a mere preparation of soil; without ascribing to it, either stimulant or attractive properties, other than promoting a fermentation in the soil, which may be called stimulant.

On a chemical investigation of the properties and composition of this substance, two things are discovered; first, that it is soluble in water, but that the solution is remarkably slow; and secondly, that it contains a very great proportion of vitriolic acid. In applying it to the soil, I have observed, that no visible effect takes place,

until after some rain has fallen subsequent to its application; that the finer it is pulverized, the quicker the effect, and the shorter the duration; the fine dust blown from the hand at the edge of the sowing, or between the casts, some times producing as great an effect the first season, as any greater quantity, but intirely ceasing afterwards; while the middle of the casts, where most of the coarser parts fell, will show the effect for several years, giving the crop a striped appearance: that where the soil contains a large proportion of clay, it has no perceptible effect; and that on a fine mellow soil, the effect is but very little, sometimes not perceptible. These observations I expect, have been common to many practitioners; from which I infer, that it is first slowly dissolved by the rains; that after solution, decomposition takes place in the soil; and the vitriolic acid being thereby set at liberty, to combine with any other base it may find in the soil, effervescence or fermentation (a well known effect of chemical combinations and decompositions) is from time to time produced; thereby separating the parts of the soil, and giving it that appearance and texture, which is common to all rich soils; and that this state always exists, where the gypsum takes considerable effect on the growing crops, I am bold to assert: In general it is very visible on the surface, but always by passing through it with the plough.

I might here risk an opinion, why the application of plaster to clay, fails of exciting a sufficient degree of fermentation, to effect a separation of its parts; but as I by no means profess a critical knowledge of chymistry, shall leave it to others better versed in that science, to assign the cause, and only assert the fact, that by such applications the tenacity of the soil is not destroyed, or any visible effect on vegetation produced. In an open mellow soil, great effects are not to be expected, because the state which the plaster is calculated to produce, already, in a great measure existing, leaves it little to do.

But it will no doubt be queried how I account for the appearance before mentioned of the dew remaining lon-

ger on the grass, where the plaster has taken effect, than where none has been applied? To this I answer that it is not in consequence of a greater quantity falling thereon, but because it is more slowly evaporated. Whoever will be at the pains to examine, will find, that this appearance is not confined to the plaster; but that grass growing on ground made rich by any other means, will show the same difference, when compared with the same kind, growing on poor ground along side of it; or if observed when the sun shines after a shower of rain (when both must be effectually wetted without attraction) the same thing will be seen, and is easy to be accounted for on philosophical principles. The soil upon which the grass grows luxuriantly and retains the moisture, is always of a darker colour and softer texture, than the poor soil adjoining: it being therefore more fitly adapted to imbibe the solar rays, they pass freely into it, while they are plentifully reflected back from the hard light coloured poor soil, on the drops of moisture suspended on the grass, operating in the same manner as the rays of heat from a reflector placed behind roasting meat: Add to this that the grass always grows thickest on the rich soil, which will also contribute to prolong the drying operation.

Where this manure has great effect, it in some measure answers the purpose of deep ploughing; many having discovered that washing ceases where it is frequently applied with advantage to the crops This is a certain proof that the soil is opened to a sufficient depth to imbibe the whole of the heaviest rains, and thereby prevents the accumulation of water on the surface: Hence we may safely conclude, that its operation continues much deeper than the usual ploughing. This is the secret which has prevented some Pennsylvania improvers from discovering the necessity of deep cultivation. I have been told that some great plaster users when consulted on the subject of deep ploughing, have answered, that their crops have succeeded well with the usual depth, and therefore have not seen the necessity of going deeper. But let

them cease to use the plaster, or confine their operations to a soil where its effects are inconsiderable, and then, after a fair trial of both methods, if they do not see cause to change their opinion I am very much mistaken.

Judging from the experience we have had of this manure, the judicious use of it is certainly to be recommended, while it can be had at the present low price. I prefer using it as a top dressing for upland grasses, at the rate of from three pecks to a bushel per acre. But those who substitute it for every other kind of manure and neglect all other means of improving their lands, will probably one day find, that they are not so far advanced in agricultural knowledge, as their present success may lead them to suppose.

I am acquainted in some neighbourhoods, where the farmers are fast increasing in wealth; their crops having nearly doubled within seven years, and the face of the country astonishingly changed for the better; and yet I do not believe they have made much progress in substantial agricultural knowledge. Accident has put them on the use of gypsum, and this has done every thing for them that is done; if accident should again deprive them of it, they will probably, in a few years, find the quality of their soil and quantity of produce nearly the same they were before the use of it.

This however is far from being the case with all who are in the practice of using it; there are in America men of observation, of genius and industry, who are making the best use of this valuable foreign manure, while it is in their power; but at the same time are paying such attention to the principles of agriculture in general, that if this should be immediately withdrawn from them, they would nevertheless, be found in the high road to improvement, and some of them perhaps are already in possession of the secret, of preserving their farms for any length of time, in a productive, and even improving state, without any foreign assistance whatever.

Before I leave the subject of gypsum I would just observe, that although I think highly of Richard Peters'

publication on this subject in general, yet I cannot unite with him in believing it a "whimsical substance; on the contrary, I believe it to be as perfectly regular in its operations as any other manure, when applied to soils upon which it is capable of acting. The quantity of moisture it receives, will no doubt, in some measure govern the effect, but this I believe will be invariable: the same causes in this, as well as other manures, uniformly producing the same effects: In short, I have never yet seen any of its effects or failures, but what may be accounted for by the foregoing theory.

I have recommended some agricultural publications written in our own country, in preference to any European authors, because I think they are more to be relied upon in American practice. General principles are the same in all countries; but in their application, the soil, climate, and a number of local circumstances, ought always to be taken into consideration; to which it is but too evident my countrymen have not been enough in the habit of attending.

In Great Britain, their practice is acknowledged to be more perfect than in any other part of Europe, and yet a late author is of opinion, that their tillage land in general, does not produce more than one third of what it is capable. They are not subject either to the excessive heavy rains, or hot dry weather that we are; absolutely requiring with us, a greater depth of cultivation to counteract the bad effects of the climate on the soil; and yet their ploughing is deeper than ours; and the probability with me is, that this remains to be one material point in which they have yet to improve. I am told that about London and other places where land is very dear, their gardeners find their account in once at least, stirring their ground from two and a half to three feet deep.

I shall conclude these remarks, with observing, that although I think deep culture a matter of the first importance in this climate, yet there are other subjects, which ought to engage our attention more closely, than the appearance of our country indicates they have hitherto

done. Among these are an economical choice and consumption of crops, for the support and fattening of live stock, and methods for the saving of timber. With respect to the first, it is certain, that one half the ground, and half the labour, generally appropriated to the purpose, is amply sufficient; or what is the same thing, the same ground and labour may be made to support and fatten double the number. It is also demonstrable, that half the quantity of woodland generally thought necessary for fuel, fences, &c. will, with proper management, be sufficient; this will also be a saving of labour in nearly the same proportion. But as I have already exceeded the limits at first contemplated, and very probably have written more than some who have the most need will be willing to peruse, I shall at present spare myself the labour of adding any thing further on these subjects; and thereby avoid swelling this pamphlet to what many may think an unnecessary size, after so many volumes have been written on the subject of agriculture.

USEFUL ARTS AND DOMESTIC MANUFACTURES.

To the Stockholders of the Athenian Society.

The President and Directors of the Athenian Society submit the following statement of the business and progress of the institution, for the year 1811, since the last exhibit submitted on the 2d of February last:

The total amount of sales from the 1st January to 31st December 1811, is $51,519. 14 cts.

To show the progress and great increase of the sales of this institution it may be satisfactory to bring into view the sales of the several years—

	mo.	*dolls.*	*cts.*
Sales from 1st Jan. 1809 to 1st Dec. 1809	11	17,608.	95.
1st Dec. 1809 to 31st Dec. 1810	13	32,137.	92.
1st Jan. 1811 to 31st Dec. 1811	12	51,519.	14.

The nett profits of the last year are apparently small, on the amount sold, which arises from the large proportion of sales made on commission, and the *moderate profits* on those sold for account of the society. It being the "avowed object" of the institution, to "facilitate the general use of American manufactures," smallness of profits is the "only certain mode" of producing this desirable object.

The amount of dividends heretofore "generously relinquished, stand to the credit of the premium fund, conformably to the act of incorporation, and held to the order of the premium committee, for premiums they may award, with "all additional dividends now declared that may not be called for, but generously relinquished and given to the premium fund."

It may be unnecessary to call the attention of the stockholders to the utility of this institution; the present exhibit is "a practical comment more forcible than speculation."

ISAAC BURNESTON.
President of the Athenian Society.

February 3, 1812.

COMMUNICATION.

The "Premium Committee" for the year 1812, appointed by the "Baltimore Athenian Society for the encouragement of useful arts and domestic manufactures," agreeably to the act of incorporation, have agreed to propose the following *premiums* for the present year.

The committee have to regret that the infant state of the fund committed to their disposal, does not enable them to offer more liberal rewards to those patriotic citizens, whose exertions are directed towards the attainment of so great an object of national wealth and independence. The success, however, of the Institution, beyond even the expectations of its friends, affords a well grounded hope, that in future more extensive premiums will be offered. The committee well aware that no manufacture

can ultimately succeed, which will not bear a competition, in quality and price, with any others whatever, have not the most distant idea of the manufactures of the United States now requiring any other encouragement than the fostering aid of the general and state governments: they, therefore, propose those premiums merely as honorary rewards.

PREMIUMS.

1. To the person or persons, in the United States, who will, during the present year, completely *bleach* and *finish* the greatest quantity of domestic linen, not less than ten pieces, each twenty yards long, and not coarser than a twelve hundred: a premium of a piece of *plate*, or its value, *fifty dollars*.

2. To the person who will, during the present year, manufacture the best Sheeting, made from flax, not less than ten pieces, each twenty two yards long, and nine-eighths wide; the same to be at least half bleached, and not coarser than an eight hundred—a piece of *plate*, or its value, *fifty dollars*.

3. To the person or persons, in the state of Maryland, who will during the present year, manufacture the best piece of superfine cloth, not less than twenty yards long, *a piece of plate with an appropriate motto*, or its value, *fifty dollars*.

4. To the person in Maryland, who will, in the present year, manufacture the best woolen blankets, not less than ten pair, each nine fourths wide—*a gold medal*, or its value, *thirty dollars*.

5. To the person who will, during the present year, manufacture the best piece of fancy vesting, not less than twenty yards long—*a gold medal*, or its value, *twenty dollars*.

6. To the person who will, before the first of July next, manufacture and completely bleach the finest piece of muslin, suitable for ladies' dresses, and not less than twenty yards long—*a gold medal*, or its value, *twenty dollars*.

7. To the person who will, during the present year, manufacture the finest cotton stockings, not less than five dozen—*a gold medal*, or its value, *twenty dollars*.

Candidates for any of the above premiums, to exhibit the fabrics at the Domestic Warehouse of the Society, No. 80, Baltimore street, for the inspection of the committee.

Communications, post paid, directed to the Secretary, No. 20, Chatham street, will be promptly attended to.

Signed by order and in behalf of the committee.

ROBERT M'KIM, Chairman.

JOHN D. CRAIG, Secretary.

Balt. Pap.

FROM A LONDON PAPER OF LAST SUMMER.

Holkham Sheep Shearing.

The annual sheep shearing fete at Holkham last week was more attractive than ever, and carried with it more agricultural interest than that of the memorable meetings that preceded it. The exhibitions in the course of the three first days were multifarious, and highly instructive. The extensive sheep stocks of Mr. Coke, through their various crosses, excited the liveliest speculations among the breeders, as no other flock master has yet carried the Merino cross to such an extent, and evident improvement. His perfect stock of South Downs, notwithstanding, bore the bell, as was manifested by the cast ewes, those of one of the lots of ten fetching no less than sixty three guineas. The crops throughout the extensive cultivation of Holkham appeared remarkably clean; the wheat, a general fine crop; and the barleys, though short in stem, promise to be productive of a very fair produce. With these Mr. Coke has sown nearly two hundred acres of Cock's foot grass, which he conceives to be the most succulent sheep feed that the island produces.

The hospitalities kept full pace with the agricultural improvements, and called forth several tributary speeches from distinguished orators in honour of their host, to whom the landed interest of England stands so highly indebted for his patriotic exertions. Among these the duke of Bedford, lord Donoughmore, Mr. W. Adam, Sir Joseph Banks, &c. excited the warmest applause from the numerous auditors, whom their eloquence delighted. Mr. Coke, before the distribution of his prizes, addressed the company on the last day at considerable length, in which he stated the progress of rural improvements in the county of Norfolk, and his confident hope that they would still be carried on by unabating energy to their natural and national object—agricultural perfection. Not less than four hundred agriculturists were daily entertained in the hospitable mansion at Holkham.

On Monday there was a sale of Ryland ewes, which Mr. Coke stated he had determined to dispose of, in consequence of finding from experiment that the cross between these ewes and the Merino ram, was inferior to the cross with the South Down breed. A more important sale of stock, however, took place on Tuesday in the sheep yard, where South Down theaves were sold, and South Down rams let. There were thirteen lots of South Down theaves, containing ten each, sold to the following gentlemen:

No.	1	28 gs.	Mr. Barker
	2	31	Mr. Tollett
	3	34	Lord Dundas
	4	36	Mr. Barker
	5	38	Mr. Tollett
	6	38	Lord Dundas
	7	39	Rev. Mr. Hulton.
	8	44	Mr. Saul
	9	40	Mr. Barker
	10	50	Mr. Saul
	11	44	Lord Donoughmore
	12	52	Ditto
	13	63	Mr. Saul.

South Down Rams let.

No.	Wool clipped.	Price.		Names.
2	8lb 1oz	30 gs.		Capt. Heath
3	7 2	40	10 competitors	Mr Warre
4	5 2	20	9 do.	Rev. Mr. Hulton
5	5 1	35	5 do.	Mr. Hastings
6	6 1	35		(Not let)
7	6 2	25		Mr. Wright
8	5 5	20		Mr. Barker
1	5 2	30		(Not let)
13	4 7	20		Mr. Hastings
14	5 5	40	12 do.	Rev. Mr. Crew

There was also an exhibition of prize wethers previous to slaughtering, and of the ewes out of their wool, when the company separated at half past nine o'clock.

On Wednesday morning the slaughter house was first visited. The fat South Down wethers for the prize were weighed.

Mr. T. Moore's, 26 1 2lb. per quarter, 13lb. tallow, 7lb. skin, 9lb. pluck.

Mr. H. Blyth's 22 1 4lb. do. do. 13 1-2lb. do. 9lb. do. 9lb. do.

Mr. G. B. George's, 27 3 4lb. do. do. 13lb. do 4 1 2lb. do 8lb. do.

Mr. Coke's South Down, 32lb. do. do. 20lb. do. 9 1-2 lb. do. 11 3 4lb. do.

Ditto half bred, 24 3-4lb. do. do. 15 1-2lb. do 9lb. do. 10lb. do.

Ditto South Down, 26lb. do. do. 15lb. do. 8 1-2lb. do. 10lb. do.

Ditto half bred, 28 3-4lb. do do. 20 1-2lb. do. 7 1-2lb. do. 10lb. do.

Several gentlemen made a sweepstakes of half a guinea, to determine the weight of the last sheep, but the unprecedented circumstance occurred of an equal number, without knowing each other's opinion, laying his weight 8st. 2lb. and at 8st. and the carcass weighing exactly 8st. 1lb. the bet could not be decided. Mr. Coke gave this

sheep to Mr. E. Kett, of Norwich, to be exhibited in that city.

Premiums of a piece of plate were adjudged to

C. C. Western, M. P. for the best boar.

Mr. Reeve, for the best South Down ram, and for the best Merino shearling ram, two prizes.

Mr. Reeve, Mr. Money, Mr. Hill, and Mr. George, each a prize for the best South Down Theaves, and two year old South Down wethers.

Mr. Money, Hill, for Devonshire cattle, two prizes.

Two Shepherds, viz. Isaac Harvey and William Terrington, received premiums, the former five guineas, and the latter three guineas.

The following is a statement of the sale of the Devon Cattle:

Lot.		Guineas.
1 Two year old heifer	Blyth	10
2 Do.	Butcher	11 1-2
3 Do.	Money Hill	14 1-2
4 Do.	Do.	13
5 Do.	Blyth	17
6 A cow, four years old	Butcher	12 1-2
7 Do. in calf, three years old	Money Hill	12 1-2
8 Do. do.	Do.	14
9 Do. do.	Leeds	15
10 Do. in calf, four years old,	not sold	
11 Do. aged, in calf	Money Hill	9 1 2

USEFUL INVENTIONS.

Among all the improvements, which have been made in this country for manufacturing cloths, there has been no labor saving machinery applicable to domestic uses, for spinning Cotton and Sheep's Wool until very lately.

An ingenious mechanic of this state, a Mr. BARRITT, has obtained a patent for the Domestic Roving and Spinning Machine, which promises to become of great importance to the community.

The machines which Mr. Barritt has built, consist generally of twelve spindles (but may be increased to twenty.) With a machine of twelve spindles a child of

twelve years old, after a little experience, may spin twelve runs a day (about six times the quantity usually spun by a woman) and as fine, or coarse as may be required. The yarn spun with this machine, is superior to that spun in the ordinary way—as the quality of it as to size is uniformly preserved With the same machine the Wool and Cotton is roved or roped—and the yarn twisted for stockings or other uses.

The writer of this has seen one of the machines in operation, and confidently believes it will become of more consequence for family manufactures than any other machine which has ever been introduced into the United States. *Troy Gaz.*

MANUFACTURES.

Every day furnishes us new evidence of the perfection of some important branch of this highly interesting art.

The article of fine broad cloth has, within the last two or three years, much engaged the public attention, and several manufactures in different parts of the country, have exhibited strong proofs of the valuable uses, to which the Merino wool, now grown among us is to be put.

We have the satisfaction to announce the commencement of operation, of a manufactory of this kind, which in extent is second to none in the country, and which for execution is likely to be inferior to few in the world.—That of Messrs. Dupont, Bauduy and Co. proprietors of the Elutherian Mills, in the state of Delaware. The President of the United States received his company on the first of January, dressed in a suit of superfine cloth made by those gentlemen, part of the first piece from their manufactory, and finished only on the 24th of the preceding month. Several gentlemen of Washington received from the politeness of the manufacturers, specimens of the same piece; they have been inspected by good judges, and pronounced to be not only the best sample of the production of this country; but equal in all the requisites, consistence, texture, softness, coloring and dressing, to the best quality of imported cloth.—*Nat. In-*